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## NEW SPECIES, VARIETIES AND COMBINATIONS FROM THE HERBARIUM AND THE COLLECTIONS OF THE ARNOLD ARBORETUM<sup>1</sup>

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***Rhapis excelsa*** (Thbg.) Henry in litt., comb. nov.

*Chamaerops excelsa* Thunberg, Fl. Jap. 130 (1784).—Non Martius.

*Rhapis flabelliformis* L'Héritier apud Aiton, Hort. Kew. III. 473 (1789).—Willdenow, Spec. Pl. iv. 1093 (1806).—Sims in Bot. Mag. XXXIII. t. 1371 (1811).—Martius, Hist. Nat. Palm. III. 253, t. 144 (1849).

*Trachycarpus excelsus* H. Wendland in Jour. Soc. Bot. France, VIII. 429 (1861), quoad syn. *Chamaerops excelsa* Thunb., non *C. excelsa* Martius.

Though Martius, when describing a Japanese species of *Chamaerops*, adopted Thunberg's name for that species, he was nevertheless aware, as his citations and remarks show, that Thunberg understood under the name *C. excelsa* the plant published later as *Rhapis flabelliformis* by Aiton. The type specimens in Thunberg's herbarium of which I have photographs before me represent *Rhapis* and his description is clearly based on these specimens. Only Kaempfer's synonyms "Siguro et Sodio" which he cites under  $\alpha$ ), and "Soo Tsiku, vulgo Sjuro Tsiku" which he cites under  $\beta$ ) do not belong here. The former represents *Trachycarpus* and the latter *Rhapis humilis* Bl. Thunberg's *C. excelsa* must obviously be considered as resting on his description and on the type specimens in his herbarium and not on Kaempfer's names cited as synonyms. The name *Chamaerops excelsa* Thunb. was by Aiton and later authors up to 1849 correctly referred to *Rhapis* and cited as a synonym of *Rhapis flabelliformis*, but in 1849 Martius in his *Historia Naturalis Palmarum* for the reason that the Japanese synonym "Sjuro et Sodio" represented it gave Thunberg's name to a plant later referred by Wendland to *Trachycarpus*. This view, however, can hardly be upheld and, as *Chamaerops excelsa* is the oldest name for the plant described as *Rhapis flabelliformis*, the specific name according to our rules of nomenclature, must be transferred to *Rhapis*.

In publishing the combination *R. excelsa* I am fulfilling a wish of the late Dr. A. Henry, who requested me in his letter of October 31, 1929, to publish this combination in the *Journal of the Arnold Arboretum*.

The plant described by Martius as *Chamaerops excelsa* and transferred by Wendland to *Trachycarpus* is apparently conspecific with *T. Fortunei*

<sup>1</sup>Continued from vol. x. 136.



Wendl. (*Chamaerops Fortunei* Hook.), though it may be distinguished as a variety. Whether it is identical with *C. Fortunei* var. *surculosa* Henry (in Elwes & Henry, *Trees Gr. Brit. & Irel.* VII. 1691 [1913]) I am not prepared to say. If considered specifically distinct it should receive a new name.

***Carpinus mollis*, sp. nov.**

Arbor circiter 9-metralis ramulis gracilibus novellis minute tomentellis et sparse pilosis, robustioribus glabris, annotinis glabris brunneis vel griseo-brunneis; gemmae oblongae, perulis obtusis minute ciliolatis ceterum glabris. Folia ovato-oblonga, 5–8 cm. longa et 3–4.5 cm. lata, basi cordata vel subcordata, acuminata, duplicato-serrata dentibus aristato-mucronatis, supra glabra, subtus tota facie molliter villosopilosa, densius ad costam et nervos, nervis utrinsecus 12–16 supra impressis subtus elevatis; petioli 6–14 mm. longi, breviter villosopilosi pilis longioribus intermixtis. Inflorescentiae fructiferae densiflorae cylindricae, pedunculo 1.5–2 cm. longo excluso 5–7 cm. longae et circiter 2 cm. diametientes; pedunculus et rhachis dense villosopilosa; bractae stipitatae, oblique ovato-ellipticae vel ovato-oblongae, circiter 2 cm. longae et 8–10 mm. latae, acutae, 3–5-costatae, acute dentatae, latere interiore ad basin lobo suborbiculari inflexo et nukulam obtegente instructo, latere exteriori fere recto inflexo et nukulam et lobum interiorem partim tegente; nuculae cylindrico-ellipsoideae, circiter 5 mm. longae et 2.5 diametientes, glabrae.

CHINA. Szechuan: Sungpan hsien, side of stream, *W. P. Fang*, no. 4245, August 17, 1928 (tree about 9 m.)

This new species is closely related to *C. cordata* Bl. and its var. *chinensis* Fr., but is easily distinguished by smaller leaves with less numerous veins and dense soft pubescence beneath, narrower fruiting catkins and smaller bracts. Besides by this new species the section *Distegocarpus* of *Carpinus* is represented in China by the following species: *C. cordata* Bl. var. *chinensis* Fr., *C. Wilsoniana* Hu and *C. Fangiana* Hu, of which the last two are remarkable for their very long fruiting catkins which measure 20–30 cm. in length, also the leaves are very large attaining 18 cm. in length.

***Castanea mollissima*** Blume, *Mus. Bot. Lugd.-Bat.* I. 286 (1850).—Schneider, *Ill. Handb. Laubholzk.* I. 899, fig. 563, c–d (1906).—Seemen in *Bot. Jahrb.* XXIX. 288 (1900).—Rehder in *Bailey, Stand. Cycl. Hort.* II. 682 (1914); *Man. Cult. Trees Shrubs*, 159 (1927).—Nakai in *Tokyo Bot. Mag.* XXIX. 54 (1915).—Rehder & Wilson in *Sargent, Pl. Wilson.* III. 192 (1916).

*Castanea pumila* Blume, *Bijdr.* 525 (1925).—Non Michaux.

*Castanea vesca* Bunge in *Mém. Div. Sav. Acad. St. Pétersb.* II. 137 (*Enum. Pl. Chin. Bor.* 62) (1833).—Non Gaertner.

*Castanea Bungeana* Blume, *Mus. Bot. Lugd.-Bat.* I. 284 (1850).—Nakai in *Tokyo Bot. Mag.* XXIX. 54 (1915); XL. 585 (1926).—Handel-Mazzetti, *Symb. Sin.* VII. 27 (1929).



*Castanea sativa* var. *formosana* Hayata in Jour. Coll. Sci. Tokyo, xxx. art. I. 304 (1911).

*Castanea formosana* Hayata, Gen. Ind. Fl. Formos. 71 (1917).—Makino & Nemoto, Fl. Jap. 1090 (1925).

For further citation of synonyms and literature see Rehder & Wilson in Sargent, Pl. Wilson. III. 192 (1916).

Though Blume in 1850 recognized the specific difference of the Chinese Chestnut, none of the later botanists followed him, until O. von Seemen in 1900 took up Blume's name *Castanea mollissima* for the Chestnut of Central China. Seemen, however, laying great stress on the very variable pubescence of this species referred some specimens from Northern China to typical *C. sativa* overlooking the much more reliable character of absence or presence of glands on the under side of the leaves. After having examined in 1911 Blume's type specimen in the Rijks Herbarium at Leyden I followed Seemen in accepting Blume's name *C. mollissima* for the common Chinese Chestnut. In 1926, however, Nakai after having examined the type specimens in Leyden of *C. Bungeana* and *C. mollissima* states that the leaves of the latter are tomentose beneath with simple erect hairs. It is true that in the type specimen of *C. mollissima* which I re-examined in 1928 when in Leyden most of the hairs chiefly those borne on the veins and veinlets are simple, but fascicled hairs are present on the parenchyma, scattered on the older lower leaves, more plentifully on the younger leaves. Leaves with similar pubescence can also be found on Chinese specimens as in Meyer's no. 1400a from Ya tze ko, southwest of Sian fu, Shensi, collected Sept. 2, 1914. These simple pilose hairs are characteristic for *C. mollissima*, they are sometimes only sparingly present on the young tips of branchlets, but usually they are more copious and spread often from the branchlets to the petioles, and the midrib, veins and even veinlets of the under side of the leaves. In most specimens of *C. mollissima* the under side of the leaves is densely clothed with a white tomentum of felted fascicled hairs with or without simple hairs on the veins, but sometimes the leaves are glabrescent or quite glabrous. In the absence of simple pilose hairs *C. mollissima* can always be distinguished from the similar *C. sativa* Mill and *C. crenata* Sieb. & Zucc., which both vary with leaves quite glabrous and densely felted beneath, by the absence of glands on the under side of the leaves.

*Castanea mollissima* and *C. Bungeana* I consider extreme forms of the same species, the first characterized by the presence of copious simple hairs on the branchlets, petioles and under side of the leaves and the second by the absence of simple hairs from the leaves and petioles and a closer and finer white tomentum of felted fascicled hairs which occasionally may disappear entirely and leave the leaves quite glabrous. The branchlets are never quite glabrous, but either more or less villous at least at the apex or bearing scattered pilose hairs or both. I have before me more than 90 specimens from almost all provinces of China, also from Korea and Sikkim, which show all intergradations in pubescence. The most common is the form named *C. Bungeana* by Blume and those



botanists who recognize priority of position will have to give precedence to this name which appears two pages ahead of *C. mollissima*, but according to the International Rules of Nomenclature the name *C. mollissima* should be accepted since it was selected by Seemen as the name for that particular species, though he did not cite *C. Bungeana* Bl. as a synonym.

***Lithocarpus brunnea*, sp. nov.**

Arbor 20-metralis, glabra, ramulis gracilibus, annotinis nigro-fuscis; gemmae terminales parvae, globoso-ovoideae, obtusae. Folia coriacea, graciliter petiolata, elliptico-ovata vel ovata, 4.5–9 cm. longa, basi late cuneata, lamina non vel vix decurrente, abrupte breviter acuminata acumine obtuso vel acutiusculo, integra, supra lucidula, subtus paullo pallidiora, primo intuitu glabra sed indumento tenui crustaceo oblecta, costa media supra plana subtus elevata, nervis utrinsecus 6–9 supra fere planis vel levissime elevatis subtus elevatis, venulis trabecularibus supra tantum leviter visibilibus subtus totis invisibilibus obsoletis; petioli graciles, 1–2 cm. longi, supra plani vel leviter canaliculati. Inflorescentia fructifera satis gracilis, 9–10 cm. longa, rhachi minute tomentella, cupulis 3–4-ni glomeratis plus minusve confluentibus cupuliformibus circiter 5 mm. altis et 8 mm. latis vel interdum minoribus, bracteis dense imbricatis triangulari-ovatis obtusis vel obtusiusculis leviter vel vix turgidis fusco-tomentellis, glande ovoideo-conica, 7–8 alta et lata, basi circiter tertia parte inclusa, fusco-brunnea, nitidula.

CHINA. Szechuan: Loshan hsien, Kiating, alt. 450 m., in thickets, *W. P. Fang*, no. 2290, July 28, 1928 (tree 20 m. high).

This new species is chiefly characterized by the rather small elliptic or elliptic-ovate glabrous leaves with flat midrib above and without reticulation beneath and by the slender fruiting spike, the small brown tomentulose hemispheric cups embracing about  $\frac{1}{3}$  of the conic-ovoid brown nut. It seems most closely related to *Lithocarpus viridis* (Schottky) Rehd. & Wils., *L. glabra* (Thbg.) Nakai, *L. spicata* (Sm.) Rehd. & Wils. and *L. Henryi* (Seemen) Rehder & Wils. which all differ in their larger and longer leaves with distinctly elevated midrib, larger acorns on a stouter rachis usually only at the base embraced by the nearly patelliform cupula with gray pubescent scales, the leaves except of *L. viridis* being distinctly though slightly reticulate beneath.

***Ulmus glaucescens*** Franchet in *Nouv. Arch. Mus. Paris*, sér. 2, VII. 76, t. 8, fig. A (Pl. David. I. 267) (1884).—Schneider in Sargent, *Pl. Wilson*. III. 263 (1916).—Rehder in *Jour. Arnold Arb.* IV. 168 (1923).

INNER MONGOLIA: "Toumet, Sartchy," *A. David*, no. 2634 (ex Franchet); Wu ye hsien, alt. 1200–1400 m., *R. C. Ching*, no. 15, April 2–13, 1923.

CHINA. Ch i l i : Kalgan, hill slope, *J. C. Liu*, nos. 584 and 585, May 28, 1927. K a n s u : Ho lan shan mountains, alt. 1375–2400 m., *R. C.*



*Ching*, nos. 88, 140, May 10–25, 1923 (National Geog. Soc. Cent. China Exp.) (small tree up to 6 m. high).

This species which has been known so far only from David's collection near Sartchy or Sarchi about 20 miles west of the border of Northern Shansi has now turned up east and west of this locality, namely in northern Chili, at another locality in Mongolia west of Sarchi and in Kansu. It is very similar to *Ulmus pumila* L. and like this it has small glabrous leaves with simple or nearly simple teeth, but the leaves are dull, somewhat bluish green above, comparatively shorter and broader, with fewer, usually 7–9 pairs of veins, while *U. pumila* often has more than 10 pairs of veins. The chief difference is in the fruit, which is broadly elliptic or elliptic-obovate, more or less narrowed at base and 2–2.5 cm. long, while in *U. pumila* the samaras are suborbicular, rounded at base and not more than 15 mm. long.

*Ulmus glaucescens* var. *lasiocarpa*, var. nov.

A typo recedit samaris tota facie, in centro densius marginem versus sparsius pilosis, orbiculari-ellipticis 2–2.3 cm. longis et 1.8–2 cm. latis, basi fere rotundatis.

CHINA. K a n s u : Ho lan shan Mountains, alt. 1375–2400 m., *R. C. Ching*, no. 160, May 10–25, 1923 (small tree).

This interesting variety which differs from the type in its pilose samaras resembles in this character *U. Davidiana* Planch. and *U. macrocarpa* Hance, which however, differ in their much larger doubly serrate and generally obovate leaves pubescent in *U. Davidiana*, scabrid in *U. macrocarpa*. No other species of *Ulmus* is known which varies with pubescent and glabrous fruit, but as this plant agrees in every other character perfectly with typical *U. glaucescens* and grows with it at the same locality, it can hardly be considered anything else but a variety or form of that species.

*Litsea cubeba* Persoon, Syn. Pl. II. 4 (1807).—Merrill in Philipp. Jour. Sci. xv. 235 (1919).—Rehder in Jour. Arnold Arb. x. 194 (1929).

*Laurus cubeba* Loureiro, Fl. Cochinch. 252 (1790).

*Litsea piperita* Jussieu in Ann. Mus. Paris, VI. 213 (1805).

*Persea cubeba* Sprengel, Syst. II. 269 (1825).

*Litsea citrata* Blume, Bijdr. 595 (1825).—Gamble in Jour. As. Soc. Beng. xxv. pt. I. 146 (1912).—Lecomte, Fl. Indochine, v. 138 (1914).

*Tetranthera polyantha* Wallich, Cat. no. 2538 (1830), nom. nudum.—Nees in Wallich, Pl. As. Rar. II. 67 (1831); Syst. Laur. 545 (1836).

*Tetranthera citrata* Nees, Syst. Laur. 560 (1836).

*Daphnidium cubeba* Nees, Syst. Laur. 615 (1836).

*Tetranthera floribunda* Champion in Hooker Kew Jour. Bot. v. 199 (1853).

*Tetranthera cubeba* Meisner in De Candolle, Prodr. xv. pt. I. 199 (1864).

*Tetranthera polyantha* β. *citrata* Meisner in De Candolle, Prodr. xv. pt. I. 182 (1864).

*Litsea mollis* Hemsl. var. *glabrata* Diels in Bot. Jahrb. xxix. 349 (1900), synonym.

*Lindera Dielsii* Léveillé in Fedde, Rep. Spec. Nov. x. 370 (1912).

*Actinodaphne citrata* Hayata, Icon. Pl. Formos. III. 164, fig. 21 (1913).—Kanehira, Formos. Trees, 413, fig. (1917).



*Litsaea Dielsii* Léveillé, Fl. Kouy Tchéou, 220 (1914), nomen.

*Litsea citrata* var. *citrata* Hochreutiner in Candollea II. 362 (1925).

*Litsea citrata* var. *polyantha* Hochreutiner, l. c.

*Litsea Hui* Diels in herb., synonym. nov.

I have followed Merrill in referring this very widely distributed species generally known as *Litsea citrata* Bl. to *Litsea cubeba* Pers. which is based on *Laurus cubeba* Lour. Of *Litsea mollis* var. *glabrata* Diels I have before me a duplicate of Bock and Rosthorn's no. 153, a co-type of the variety, and of *Litsea Hui* I have a specimen of Hu's no. 903, the holotype of this species. Both undoubtedly belong to *L. cubeba* (Lour.) Pers., the first specimens bearing young inflorescences and old frutescences with the fruits dropped and the second is a fruiting branch.

**Benzoin touyunense** (Lévl.) Rehder in Jour. Arnold Arb. x. 194 (1929).

*Litsea touyunensis* Léveillé in Fedde, Rep. Spec. Nov. XI. 63 (1912); Fl. Kouy-Tchéou, 220 (1914), as *Litsea touyounensis*.

CHINA. K w e i c h o u : Tou-yun, *J. Cavalerie*, no. 1, Nov. 10, 1902 (type). H u p e h : Changyang hsien, *E. H. Wilson*, no. 302, in part, Nov. 1907; Ichang, *E. H. Wilson*, no. 302, in part, March 20, 1909. K w a n g t u n g : way to Sie-kun, Lokchong hsien, North River Region, *Tsiang Ying*, no. 1436, Oct. 23, 1928 (tree 40 ft. high, with lenticellate bark and brittle branches).

FORMOSA: Karenko to So-o, prov. Karenko, *E. H. Wilson*, no. 11087, Nov. 24, 1918.

When I first identified *Benzoin grandifolium* Rehd. with *Litsea touyunensis* I pointed out the difference in the pubescence of the two specifically identical forms, but did not distinguish the glabrous plant by a distinct name. Now, however, as a well marked strongly pubescent form has come to light, it seems advisable to distinguish and name the two extremes of this species.

The type of *B. touyunense* has the under side of the leaves fairly densely villous-pubescent with the midrib glabrescent, the upper surface is perfectly glabrous, as are the branchlets and petioles, the two outer bracts of the inflorescence are glabrate and the peduncles minutely pubescent. The specimens from Hupeh and from Formosa are somewhat less densely pubescent on the under side of the leaves, while the Kwangtung specimen shows a slight and minute pubescence also on the petioles of the leaves, besides it has broader leaves up to 7 cm. wide and to 16 cm. long and larger fruits fully 2 cm. long.

**Benzoin touyunense f. megaphyllum** (Hemsl.), f. nov.

*Lindera megaphylla* Hemsley in Jour. Linn. Soc. XXVI. 389 (1891).—Gamble in Sargent, Pl. Wilson. II. 80 (1914).—Non *Benzoin megaphyllum* Ktze.

*Benzoin grandifolium* Rehder in Jour. Arnold Arb. I. 145 (1919).

*Benzoin touyounense* (Lévl.) Rehder in Jour. Arnold Arb. x. 194 (1929), in part.

A typo recedit foliis glaberrimis.

CHINA. K i a n g s i : Kiukiang Mts., *E. Faber* (ex Henry). H u p e h : Ichang, *A. Henry*, nos. 1112, 1284, 2195, 3010, 3010a; Patung, *A. Henry*, nos. 3151, 3345, 3345a and 3345b; Chienshi, *A. Henry*, no. 4508; Nanto



and mts. to the northward, *A. Henry*, nos. 6609, 7525, 7618, 7848a. Ichang, alt. 300–900 m., *E. H. Wilson*, Veitch Exped. no. 59, April and Oct. 1900; same locality, *E. H. Wilson*, Arnold Arb. Exped. no. 302, in part, March 15 and Oct. 1907; Chang-lo hsien, alt. 300–900 m., *E. H. Wilson*, no. 302, in part, April and May 1907; Chanyang hsien, alt. 600 m., *E. H. Wilson*, no. 302, in part, July 1907; Hsing shan hsien, alt. 750 m., *E. H. Wilson*, no. 302, in part, October 1907; “Ou-pan-chan,” alt. 600 m., *C. Silvestri*, no. 2985, March 23, 1910; Da yu tze, alt. 750 m., *W. Y. Chun*, no. 3567, July 27, 1922; Siu yeh see, *W. Y. Chun*, no. 4391, Oct. 30, 1922. H u n a n : in silva infra vicum Tungdjiapi prope minas Hsikwangschan distr. Hsin wha, alt. 550 m., *Handel-Mazzetti*, no. 11888, May 20, 1918. A n h w e i : Chemen, alt. 225 m., *R. C. Ching*, no. 3129, Aug. 5, 1925. S z e c h u a n : distr. “Tchen-kéou-tin,” *P. Farges*, no. 1211; Mt. Omei, alt. 300–1200 m., *E. H. Wilson*, no. 3706, in part, June 1908; Wênchuan hsien, Min Valley, alt. 600–1200 m., *E. H. Wilson*, no. 3706, in part, Oct. 1908. Y u n n a n : Yuan-chiang, alt. 1500–1800 m., *A. Henry*, nos. 13275 & 13275a.

FORMOSA. Taihoku, prov. Sekitei, *E. H. Wilson*, no. 10168, March 17, 1918.

As the above enumeration of the specimens shows the glabrous form is by far the most common and most widely distributed, its range extending from Formosa and Kwangtung to northwestern Szechuan and southern Yunnan, while the type, though of similar range, but apparently much less common, has not yet been collected in Kwangtung, Hunan, Szechuan and Yunnan, and the following form is known only from Szechuan.

***Benzoin touyunense* f. *trichocladum*, f. nova.**

A typo recedit ramulis, petiolis et costa folii subtus tomentoso-villosis, costa supra breviter minute villosa, facie inferiore praecipue ad nervos et venulos villosis.

CHINA. S z e c h u a n : Nanchuan hsien, *W. P. Fang*, no. 5843, Nov. 9, 1928.

This form on account of the dense grayish yellow pubescence of the branchlets, petioles and the under side of the midrib looks at the first glance very distinct from typical *B. touyunense* and its glabrous form and one might be inclined to rate it higher than a mere form, if not Ying's no. 1436 from Kwangtung enumerated under typical *B. touyunense* showed a slight pubescence on the young branchlets and on the petioles and thus forms a transition to the form described above.

***Philadelphus paniculata*, sp. nov.**

Frutex 3-metralis, ramulis maturi rubro-fusci, annotini cortice lamellis tenuibus solubili. Folia elliptico-ovato vel oblongo-ovata, 6–11 cm. longa et 2.5–6 cm. lata, acuminata, basi late cuneata, integra vel minute et distanter denticulati denticulis ad glandulam reductis (in ramulis floriferis